IN THE UNITED STATES DISTRICT COURT FOR THE
WESTERN DISTRICT OF OKLAHOMA

BETTY ANN MARSEE,
Administratrix of the Estate
of MARVIN SEAN MARSEE,
Deceased,

Plaintiff,

vs.

UNITED STATES TOBACCO CO.,
a New Jersey corporation,

Defendant.

No. Civ-84-2777R

TRANSCRIPT OF JURY TRIAL PROCEEDINGS
Monday, June 2, 1986

A p p e a r a n c e s:

HON. DAVID L. RUSSELL,
U.S. District Judge, Presiding

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Volume 17

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Maynard E. Peterson, CSR
Acting Official Reporter

BE IT REMEMBERED, that on the 2nd day of June, 1986, the above matter coming on for jury trial before the Honorable David L. Russell, United States District Judge for the Western District of Oklahoma, and the parties appearing in person and or by counsel as hereinabove set forth, the following proceedings were had:

AFTERNOON SESSION

Monday, June 2, 1986

WILLIAM LIJINSKY, PH.D.,

resumed the witness stand and testified further as follows:

THE COURT: Be seated. You may continue, Mr. Jennings.

MR. JENNINGS: Thank you, Your Honor.

CROSS EXAMINATION (continued)

BY MR. JENNINGS:

Q. Doctor Lijinsky, you have lived in the United States since 1951?

A. Yes.

Q. And you have studied nitrosamines since

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1959?

A. Yes.

Q. In fact, that's been practically the entire work you have done since '59; is that correct?

A. Not -- no, not really. I also spent a lot of time studying polycyclic hydrocarbons and aflatoxins and some work on aromatic amines.

Q. You have never done any study on oral cancer in humans?

A. No.

Q. And I believe that you said you were aware of some epidemiological studies --

A. Yes.

Q. Are you aware of the Winn Study?

A. Yes.

Q. And you are aware of the -- is it Behde?

A. Behde.

Q. B-e-h-d-e?

A. Yes, she's an Indian scientist.

Q. And when did you first become aware of those two epidemiological studies?

A. I think I learned about those for the first time, those specific studies about chewing tobacco and snuff in 1983 at the International Conference on Nitrosamines in Banff.

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Q. At Banff, Canada?

A. Banff, Canada.

Q. Do you remember when in 1983 that was?

A. I think it was the beginning of September.

Q. Did Doctor Winn make a presentation there?

A. Yes.

Q. And did she describe her study and what it showed?

A. Yes, she did.

Q. And did she describe what she found in her study with regard to tongue cancer?

A. Now, that's very difficult for me to remember. I don't remember details of her presentation. I think she talked about cancer of the oral cavity, not specifically of the tongue.

Q. You don't recall any specific report about tongue cancer?

A. I don't recall any, but there might have been some.

Q. I understand. What about Doctor Behde?

A. Doctor Behde certainly talked about cancer of the oral cavity.

Q. Did she talk about tongue cancer?

A. She might have, but I don't remember.

Q. Doctor Lijinsky, you remember when your

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deposition was taken on April 21st of this year, do you not?

A. Yes.

Q. That would have been a month-and-a-half ago --

A. Yes.

Q. -- almost. By the way, you required me to give you a check for $1500 before you would testify, didn't you?

A. Yes.

Q. I believe you told me that was your standard charge per day was $1500; is that correct?

A. For depositions or trials, yes.

Q. Have you read your deposition?

A. Yes, I read it and corrected it.

Q. You read it and corrected it?

A. Yes.

Q. May I hand you a copy of it so we can refer to it?

A. Yes. Thank you.

Q. And did you sign your deposition?

A. Yes.

Q. I don't know whether that copy is signed or not, Doctor. In any event, may I refer you to Page 152.

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A. Yes.

Q. And starting with the question on Line 11.

A. Yes.

Q. The question was: "When did you form your opinion or when did you first come to the opinion that snuff is a cause of cancer of the tongue in humans?

"Answer: When I read something about the epidemiology, when it came home to me what these epidemiological studies meant, which was at the time that I talked to Mr. Braly."

Is that what you said?

A. Yes.

Q. And was that when you first came to the conclusion that tongue cancer in human beings is caused by snuff?

A. I'm sorry. Would you repeat the question again so I can respond to it properly.

Q. You testified that you formed your opinion, first came to the opinion that snuff is a cause of cancer of the tongue in humans when you read something about the epidemiology when it came home to you what these epidemiological studies meant, "which was at the time that I talked to Mr. Braly."

A. Yes.

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Q. That was your testimony?

A. Yes.

Q. And that is the truth?

A. Yes, I agree with that.

Q. Okay. And then you were asked: "Do I understand from that that you first formed your opinion on snuff as a cause of cancer of the tongue in humans within the last two years?"

And your answer was: "It was at the back of my mind because Hoffmann and Hecht had talked about it in connection with the oral cavity, cancer of the oral cavity, from their analysis and their experiments with nitrosonornicotine in the mouth and when I found out what the difference in the constituents of snuff and the constituents of tobacco smoke were.

"Question: But as to the cause of cancer of the tongue in humans, you didn't form that opinion until after you had met with Mr. Braly?

"Answer: It didn't become firm in my mind even though I had so many experiments in which nitrosamines cause tumors of the tongue."

Now, is that your testimony?

A. Yes.

Q. And before you met Mr. Braly, you hadn't

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come to the opinion that snuff caused tongue cancers, had you?

A. It wasn't -- it was, as I said, at the back of my mind that tumors of the oral cavity were related to the chewing of tobacco or taking tobacco in the mouth, and I hadn't formed an opinion about it, firm opinion about it, but it was in the back of my mind.

Q. Doctor, let's take a look, if we may, at some of the things you have said before you met Mr. Braly.

A. Yes.

(Handed to the witness).

A. Thank you.

Q. If you will look at the first document there in that packet I handed you.

A. Yes.

Q. The first one is a paper called -- it is shown as being in Cancer Research?

A. Yes.

Q. And it is a paper entitled "The Current Status of Experimental Chemical Carcinogenesis and Its Applications to Human Cancer Risks" by William Lijinsky. Is that correct?

A. Yes.

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Q. If I may direct your attention to the abstract at the top of the left-hand column on the first page. Do you see that?

A. Yes.

MR. BRALY: Could we have the citation?

MR. JENNINGS: The citation is July, 1979, Cancer Research, Volume 39, Pages 2887 to 2890.

Is that correct, Doctor Lijinsky?

A. Yes.

Q. (BY MR. JENNINGS) And there you say, "It is not known" -- I'm looking down at the final two sentences of the abstract -- "it is not known to what extent exposures to any particular chemical carcinogens are responsible for the major human cancers, and the agents responsible for most of them are not known. It is probable that many noncarcinogenic chemicals act as promoters of carcinogenesis, and among these alcohol can be included as an important contributor."

Is that what you said then, sir?

A. That's what I wrote.

Q. That's what you wrote? I quoted you correctly?

A. Yes.

Q. Look at the next paper in that set. That's

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entitled "Nitrosamines and Their Precursors in Food." What --

MR. BRALY: Do you have the citation?

MR. JENNINGS: That is what I was trying to find out.

Q. (BY MR. JENNINGS) Do you remember where that was published?

A. Yes, I can help you with that, Mr. Jennings. It was part -- it was a chapter in a book that was called "The Origins of Cancer." It was published by Cold Spring Harbor Laboratories, and it was a record of a symposium, a very large symposium held there in 1976.

Q. 1976?

A. 1976.

Q. And published in 1977?

A. Yes.

Q. And you were one of the authors of that particular paper?

A. Yes.

Q. It starts out by saying, "It is said that the origins of most of the cancers which develop in that 25 percent of the human population so afflicted are obscure. A small proportion can be attributed to prolonged exposure to known industrial carcinogenic

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chemicals in the workplace. For the remaining 99 percent or so of cancers, four-fifths of which are believed due to chemical exposures, we have no explanation. Among all of the groups of known chemical carcinogens, the N-nitroso compound possesses characteristics which make them prime candidates as agents in the induction of human cancer, even though as yet there is no good epidemiological evidence linking them with human cancer. It is probable that too few sound epidemiological studies of this subject have been carried out to provide the relevant correlations."

Did you say that in 1976?

A. I wrote that.

Q. Well, all right, you wrote it. Was that your opinion?

A. No, I don't think I would hold quite to that opinion now. I don't think we --

Q. No, excuse me.

A. Have --

Q. Excuse me. Was it your opinion at the time that you wrote it?

A. That was my opinion at the time I wrote it.

Q. I know you don't hold that opinion now.

A. Right.

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Q. But before you met Mr. Braly, that was your opinion?

A. No, not before I met Mr. Braly.

Q. This was before you met Mr. Braly, in '76?

A. It was.

Q. All right.

A. But the meeting of Mr. Braly was not the point at which I changed my opinion.

Q. Do you know a Doctor James A. Miller?

A. Yes.

Q. Who is Doctor Miller?

A. I beg your pardon?

Q. Who is Doctor Miller?

A. Doctor Miller is one of the foremost workers in the field of chemical carcinogenesis. He is at the University of Wisconsin.

Q. Is he generally well-recognized?

A. Yes, he is.

Q. Is the next paper that you have there entitled "Organ and Species Specificity in Chemical Carcinogenesis"?

A. Yes.

Q. And that is from a publication "Basic Life Science"?

A. Yes.

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Q. In 1983?

A. Yes, it is from -- it is a book again that was written as the record of the conference held on the subject of organs and species specificities in chemical carcinogenesis.

Q. Did Doctor Miller at the time of that symposium or that meeting say, "I don't think we can rely on extrapolations of data on chemical carcinogenesis from experimental animals to humans, no matter how sophisticated or plausible these extrapolations may seem, until we know far more about chemical carcinogenesis in humans?"

Were you present --

A. In humans?

Q. Let me --

A. Could you show me this, this statement?

Q. Sure (indicating).

A. Yes. Thank you.

Q. And Doctor Miller, I presume, since this preface has his name at the bottom of it, was saying, "I don't think we can rely on extrapolations of data on chemical carcinogenesis from experimental animals to humans, no matter how sophisticated or plausible these extrapolations may seem, until we know far more about chemical carcinogenesis in humans."

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Is that correct?
A. You read it correctly.
Q. Is that what he said?
A. That's what he said.
Q. Do you agree with that?
A. No.
Q. The next paper is entitled "Chapter 9, Current Concepts in the Toxicology of Nitrates and Nitrites, and Nitrosamines," --
A. Yes, sir.
Q. -- which apparently -- Is that a book, "Advances in Modern Toxicology"?
A. Yes. I was asked to contribute a chapter in commemoration of a man who was one of the prominent scientists in the Food & Drug Enforcement who unfortunately died of a heart attack, who was Leo Friedman. This was more or less a memorial volume to him, and several friends of his, who were active scientists, were asked to write an article about something that interested them in memory of this fine man.
Q. All right, sir. And in that chapter at Page 151, --
A. I didn't catch that, Mr. Jennings.
Q. Excuse me. At Page 151.

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A. 151.

Q. Under the subhead "Nitroso Compounds in the Environment," did you say, "Historically there has been no association made between exposure to nitrosamines and human cancer of any type. This could be because there is no such association."

A. Yes, I said that.

Q. And did you believe it at the time?

A. I changed my opinion.

Q. I see. But at that time that's what you thought?

A. I recognized at that time the possibility there was no such association. I don't believe that anymore.

Q. And when was that? When did you write that?

A. I wrote this, I think, in 1975, maybe even -- no, I think I wrote it in 1975.

Q. All right, sir. And were you a member of a W. H. O., that is World Health Organization task force that investigated nitrates, nitrites and N-nitroso compounds?

A. Yes.

Q. And that was in 1978?

A. Yes.

Q. And I will refer you to Page 17. You find

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that --

A. Yes.

Q. -- in your packet there. And under the heading on Page 17 on the right-hand column of N-Nitroso Compounds, it says, "So far, correlations have not been established that link cancer in man with exposure to N-nitroso compounds or their precursors, but the possible role of N-nitroso compounds and in particular their in vivo formation in the development of nasopharyngeal, oesophageal, and stomach cancer has been suggested."

Have I read that correctly?

A. You have read it correctly.

Q. And did you agree with that opinion at that time?

A. At that time I agreed with that, but I have changed my opinion somewhat. That is not my wording that second sentence. It is wording of the conference.

Q. I understand that.

A. Yes.

Q. That was not written by William Lijinsky?

A. No, no.

Q. But it was something that at the time you agreed with?

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A. I agreed with mostly, not entirely even then.

Q. Doctor, if you will, look at Page 80. Apparently for some reason Page 80 got left out of my copy, so I must look over your shoulder a minute.

A. It's on the other side.

Q. May I borrow this just a second?

A. Certainly.

Q. Okay. It is this paragraph here.

A. Thank you.

Q. And the paragraph I have indicated to you reads, "No reports are available concerning carcinogenesis in industrial or other workers exposed to N-nitroso compounds, nor have relationships been established, from epidemiological and analytical data, that link cancer in man with exposure to N-nitroso compounds or their possible precursors such as nitrates, nitrites and compounds that can be nitrosated, occurring as food components, drugs and pesticides."

I believe that was in 1978; is that correct?

A. Yes, it is from the same document.

Q. Did you agree with it at that time?

A. No, I did not agree with it entirely at that time, but I did not make my disagreements public by

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writing a minority section of this document.

Q. All right, sir. If I may, let me refer you to one -- I am going to have to find it, Your Honor -- do you see a paper entitled "Organ and Species Specificity in Chemical Carcinogenesis"?

A. Yes.

Q. Let me refer you to Page 69 of that paper.

A. Yes.

Q. 1983; is that the correct date on that?

A. It was published in 1983. It was written -- I think the meeting was held in 1982, but I can't be absolutely certain.

Q. You see the subhead "Nitrosodiethanolamine"?

A. Yes.

Q. And it reads under that paragraph, "One environmentally significant nitrosamine that has been studied in rats and hamsters is nitrosodiethanolamine, which is found at considerable concentrations in synthetic cutting oils and cosmetics as well as tobacco smoke. This nitrosamine, once considered a relatively weak carcinogen, on re-examination appears to be moderately potent in inducing liver tumors in rats. In the Syrian hamster it induces mainly tumors of the nasal cavity. The risk it might pose to humans is

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unknown, and little study of its mechanism of action has been done, apart from the observation that much of the administered dose is excreted unchanged in the urine of rats. Another significant finding is that nitrosodiethanolamine does not appear to be mutagenic to bacteria, even when activated by rat liver microsomes."

Have I read that correctly?

A. You have read that correctly.

Q. And who wrote that?

A. I beg your pardon.

Q. Who wrote that?

A. I think I wrote it.

Q. You think you wrote that. All right, sir. And when did you write that, 1983?

A. Yes.

Q. And did you believe it at that time?

A. I beg your pardon.

Q. Did you believe it at that time?

A. Yes.

Q. Have you changed your mind since?

A. The only way in which I have changed my mind is that more studies of this mechanism of action have been done since, maybe by me.

Q. Okay.

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A. Some by Steve Hecht.

Q. All right, sir. Let me ask you to turn now to the last paper, which is one entitled "Species Differences in Nitrosamine Carcinogenesis."

A. Yes.

Q. And that was in Cancer, Journal of Cancer Research Clinical Oncology?

A. Yes.

Q. That date is 1964?

A. 1984.

Q. 1984?

A. Yes, sir.

Q. That was in July?

A. Yes.

Q. And on Page 52, beginning the first full paragraph -- the only full paragraph on the left-hand column, do you see that in the middle of the Page 52?

A. Yes.

Q. And beginning down about nine lines from the end of that paragraph, and the first word is the final word at the end of the line which reads, "This suggests -- " Do you see that?

A. Yes.

Q. " -- that the type of tumor induced by a carcinogenic N-nitroso compound (and possibly other

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types of carcinogen) is a matter of congruence of particular chemical structure with a particular species. This underlines the difficulty of extrapolating the tumor susceptibility of humans exposed to a particular carcinogen from the results in an experimental animal."

Is that correct? Have I read it correctly?

A. You have read it correctly.

Q. And did you say that?

A. I said that.

Q. And did you believe it?

A. Yes.

Q. And do you still believe it?

A. I believe it is difficult, but not impossible.

Q. All right, sir. Doctor Lijinsky, you have testified to some extent about mutagens --

A. Yes.

Q. -- and how you test mutagens with the Ames test.

A. Yes.

Q. And I thought I heard you testify that there is some sort of correlation between mutagenic and carcinogenic; is that correct?

A. It's a statistical correlation, a numerical

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correlation. It is not a correlation of coordinate fact.

Q. Do you expect if you apply the Ames test and specifically that test is conducted by seeing what effect the particular agent or compound or whatever will have on bacteria; is that right?

A. Could you just repeat the question.

Q. You tell me what you do in the Ames test. Maybe that will be easier.

A. What -- how one does it?

Q. Yes, how does it test for mutagenicity.

A. There -- I don't want to go into too much detail, but I will if you wish me to.

Q. No, I want you to make it as brief as you can make it understandable.

A. Mutant strains of bacteria were created by Doctor Bruce Ames, and these mutant strains required histidine for their normal growth and function. Normal nonmutant bacteria, of course, make histidine and make all their self-constituents from very simple organic compounds in the medium in which they live, but these mutant strains require histidine, so you grow them on a medium which lacks histidine. You have removed the histidine from it. So since they can't make their own histidine, they don't grow. You

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then add the agent you are testing as a mutagen, and if the compound, the substance is mutagenic, it will convert a certain number of those bacteria, a certain proportion of those bacteria back to a form or back to a state in which they can make histidine, and those colonies will grow.

Q. And that then tells you whether or not, according to that test, it is mutagenic; is that correct?

A. It will not only tell me that, it will tell you how mutagenic it is in that system relative to another substance, because you can count the number of colonies produced by a given dose of the agent.

Q. Have you applied that test to nitrosonornicotine?

A. Yes, I have. Well, --

Q. That's NNN; is that correct?

A. NNN.

Q. All right.

A. May I qualify that? When you asked me have I applied the test, I had a group in my laboratory that carried out this test, and they carried out the test under my supervision.

Q. All right, sir. That's what I had in mind.

A. Is that understood?

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Q. Sure. That's all right. I just want to know if you are aware of the test having been made.

A. Yes.

Q. What was the result?

A. The result of that test in my laboratory that the nitrosonornicotine was not mutagenic.

Q. The test was negative?

A. That was my conclusion.

Q. As I understand your testimony, you think that NNN is carcinogenic?

A. Yes.

Q. So as the fact that it was carcinogenic didn't result in it being shown by the Ames test to be mutagenic?

A. Right.

Q. So is there any correlation between mutagenicity and carcinogenicity?

A. There is a numerical or statistical correlation. What is lacking is a relation that is carcinogenicity in the same phenomenon as mutagenicity.

Q. Well, I wonder how you feel about whether there is or isn't a correlation.

A. There is a statistical correlation, and it is to the extent that approximately 90 percent of

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N-nitroso compounds that have been tested as mutagens are carcinogenic and mutagenic -- I'm sorry, I didn't phrase that properly. 90 percent of the carcinogenic N-nitroso compounds are also mutagenic in that system, approximately.

Q. Doctor, when you were asked at the time of your deposition, if you will refer to Page 135, --

A. Yes.

Q. -- Line 11. Do you see Line 11?

A. Yes.

Q. The question, "What is the -- What, if any, is the correlation between mutagenicity and substances which produce malignant tumors? Is there any correlation?

"Answer: I must confess that my feeling is there is no correlation, and I have stated so in some of my papers."

Was that your testimony, Doctor?

A. Yes, but I think I used the wrong word. I meant there is no relation. There is a numerical correlation.

MR. BRALY: Your Honor, under the rule of completeness, I would ask that the witness be allowed to read the rest of his answer to the question.

MR. JENNINGS: I will be happy to read it.

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Q. (BY MR. JENNINGS) "There is a rough qualitative correlation; that is, most of the carcinogenic nitrosamines are mutagenic, but some carcinogenic nitrosamines are not mutagenic and some noncarcinogenic nitrosamines are mutagenic. Quantitatively, there is no relationship at all; that is, the strongest -- if you have a scale, the strongest carcinogen is not necessarily the strongest mutagen."

Is what that you said?

A. Yes, and that qualifies -- qualifies it very much better. That -- that I certainly agree with.

Q. All right, sir. Then I have read everything you said on the subject at that time, have I not?

A. Yes.

Q. Let's go on. "As a matter of fact," the question was, "a strong carcinogen may not even be mutagenic?

"Answer: It has -- there are cases in which the strong carcinogen is not mutagenic."

A. Yes.

Q. Is that right?

A. I said that.

Q. So the fact that a substance might test out as mutagenic on the Ames test would not establish

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that it was carcinogenic, would it?

A. No, but only suggests that it was.

Q. Suggests the possibility that it is?

A. Yes.

Q. And the fact that it was not mutagenic wouldn't rule out the possibility that it was carcinogenic?

A. Not in my opinion.

Q. Doctor Lijinsky, you did a computation by which you came up with a figure of 16.6 milligrams per kilogram.

A. Yes.

Q. It is up there on the paper; right? That is your computation of the exposure of a 60-kilogram person to nitrosamines by using a certain amount of Copenhagen Snuff over a certain period of time; is that right?

A. Yes.

Q. Now, what assumption did you make with regard to the amount of nitrosamines?

A. I made -- and if you don't mind, I will refer to my notes here. I made the assumption that the concentration of nitrosamines in the snuff was as given in the analysis I think of Copenhagen Snuff in Hecht and Hoffmann's paper.

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Q. The tables you looked at?

A. Yes, the table we already saw.

Q. What did you do with those figures?

A. I added up the following substances, the concentrations of the following substances, nitrosodiethanolamine, or NDMA, which is a hundred parts per billion; nitrosopyrrolidine, 360 parts per billion; nitrosomorpholine, 690 parts per billion; nitrosodiethanolamine, 3300 parts per billion; nitrosonornicotine, 33,000 parts per billion; and NNK, 4600 parts per billion. That came to 42,050, or approximately 42,000 parts per billion total of those carcinogenic nitrosamines.

I then used the figure there are 34 grams of snuff in a can of Copenhagen in which 50 percent approximately is water, and these measurements were made on the basis of dry weight, that is the snuff after water had been removed, so I used 17 grams per can as the figure, two-thirds of a can a day, which is a reasonable -- I am told reasonable consumption for heavy, relatively heavy user of snuff, minus 11.3 grams of snuff per day, which multiplied by 42,000 parts per billion is 476 micrograms per day of those carcinogenic nitrosamines. I then multiplied that by a six-year exposure of 365 days times 476, and I came

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to 1,042,000 micrograms of those carcinogenic nitrosamines in that six-year exposure, which amounts to about a gram, divided by 60, comes to about 16.6 milligrams per kilogram of body weight, total dose.

Q. So you assumed that the total nitrosamines in the product were consumed or taken into the body; is that right?

A. Yes, I did.

Q. Is that a valid assumption?

A. I beg your pardon.

Q. Is that a valid assumption?

A. It's an assumption that probably slightly -- that probably exaggerates the true exposure, but how much it exaggerates, we don't know.

Q. Right.

A. It is certain the people who take that, use that amount of snuff will probably differ in the amount of nitrosamine to which they are exposed as a result depending on their habits.

Q. That computation exaggerates the amount and you don't know how much. That's what you said, wasn't it?

A. Yes.

Q. Thank you, sir.

You spoke about three carcinogens that were

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not nitrosamines in connection with some exhibit that Mr. Braly showed you. One of them was vinyl chloride?

A. Yes.

Q. That's not in tobacco, is it?

A. I think there are some reports of vinyl chloride in tobacco smoke, tobacco smoke.

Q. I am talking about snuff.

A. I don't think so.

Q. All right, sir. And how about 2-Naphthylamine, Naphthylamine; is that correct?

A. 2-Naphthylamine, yes, that's may English way of pronouncing it. I don't know whether that is the right way.

Q. Is that in snuff?

A. Not that I know of.

Q. Benzidine, is that in stuff?

A. Also not that I know of.

Q. All right. So whatever the properties of those carcinogens, -- are they carcinogens?

A. Yes.

Q. And I believe those were the only ones that you said were known to be carcinogenic in humans.

A. Oh, no, not by any means.

Q. Of the list that was put up there, those are

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the only ones that you said were known to be carcinogenic to humans.

A. Of the substances on that list, the -- there were four that are believed to be carcinogenic in humans.

Q. I thought you distinguished between --

A. Known to be carcinogenic in humans.

Q. -- those that were known to be and those that were believed to be. I know what you believed, but what I am talking about is those that have been shown to be carcinogenic?

A. 2-Naphthylamine and benzidine are considered to be a human carcinogen.

Q. Is that found in snuff?

A. No, I don't know.

Q. You don't know. As far as you know, is it?

A. As far as I know, it isn't, but I don't know if anybody has ever looked, which is one of the things that happens.

Q. So the four that were listed that you say are believed to be or known to be carcinogenic in humans, none are those are found in snuff, are they?

A. Right.

Q. What is a papilloma?

A. Papilloma is a benign tumor of the squamous

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epithelium.

Q. Where is it found fairly common?

A. You are asking me about things in an area which I am not an expert.

Q. Sure.

A. I am reporting what --

Q. I apologize. If I have asked you something outside your field, I apologize. I did not mean to.

You have been asked a little bit about your knowledge of animal studies using snuff --

A. Yes.

Q. -- or snuff extract or some form of the product itself. I would like to go into that a little further with you, if I might.

MR. JENNINGS: If the Court please, we would like to use this chart. It is illustrative. We are not offering it in evidence, but we would like to use it as a document to testify from.

THE COURT: Go ahead. Any objection, Mr. Braly?

MR. BRALY: None whatsoever, Your Honor.

Q. (BY MR. JENNINGS) Doctor Lijinsky, I guess you would agree that experiments that turn out with a negative result are important to know about.

A. I beg your pardon?

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Q. If you experiment and the result is negative, that is still important to know about, isn't it?

A. Yes, if it is a validly constructed experiment --

Q. Sure.

A. -- as positive would be.

Q. Doctor Lijinsky, I wanted to give you a copy of the papers which are the basis for this chart that we put up here, and I also have there for you a typewritten copy of the chart.

Now, the first item on the chart shows the date of 1959 and shows that the author Peacock and Brawley is published in the Journal of Plastic and Reconstructive surgery, and the test substance was snuff and chewing tobacco, and the species were hamsters, and it looks like they tested a hundred hamsters in two sets of 50 and got no test animal with oral cancer; is that correct?

A. I would have to read the paper, if you don't mind, to see whether I believe it is a properly constructed experiment, so that so I can see what the conclusion was.

Q. You were not familiar with that paper?

A. No. But I see in the summary it doesn't

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rule out a cause-and-effect relationship between the use of snuff in mice and cancer, just that it has not been proven.

May I read it?

Q. Sure.

A. "More comprehensive and difficult analytic surveys of the general population to compare snuff and tobacco users with nonusers are necessary before we can be certain that a statistically significant cause-and-effect relationship exists between the chronic use of tobacco and snuff and development of mouth cancer."

Q. Sir, that was the reason they did the experiment, wasn't it?

A. Yes. Well, I don't know what the reason. I haven't read the paper. I don't know what the reason is that they did the experiment.

Q. What did the experiment show?

A. If you will excuse me, I will have to read the paper.

Q. All right.

MR. BRALY: Your Honor, the witness testified earlier that he was not intimately familiar with these animal experiments, and I don't mind counsel going into it, but I am going to ask the

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witness be allowed to read the papers if he said he wasn't familiar with them before counsel starts asking him questions about it.

THE COURT: That's what he is doing.

THE WITNESS: I haven't read it extremely thoroughly, but I think I have got the gist of it.

Q. (BY MR. JENNINGS) What is the gist of it, Doctor?

A. The gist of it is that tobacco -- snuff was implanted in the cheek pouch of a hamster, a specially constructed pouch, and was left there for I think a year, at least a year. Many of the animals developed infections. There was a single implantation of a piece of -- a wad of snuff or a paste of snuff, and I don't think the negative result in this experiment means a thing. I don't think the negative result means a thing.

Q. Doctor Lijinsky, were you familiar with any of those papers?

A. May I look through the list?

Q. Yes, please.

A. I have read one or two of them.

Q. Which ones have you read?

A. I have read I think it was Hirsch and Johansson, but I am not absolutely certain, because

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Hirsch also had a paper in that International Agency for Research on Cancer nitrosamine report from the Banff meeting in 1983, and I did read that one, so I don't remember -- I think they reported -- the two papers reported the same result), the same experiment. I don't know whether I read this specific one or one that would have been in the Banff meeting.

Q. Do you recall whether or not the Hirsch and Johansson paper reported one cancer as shown on that chart?

A. Yes, I think -- May I read the paper and see whether that is so? That's general pathology, yes. I don't want to get them out of order.

Yes, they found one tumor.

Q. What did he say about it? What did the author say about that one? Do you remember?

A. This is under the heading "Morphological Findings in the Oral Cavity and Mucosa."

"Only one macroscopic tumor was observed. This rat belonged to the first test group, and the tumor was detected after 8.5 months. It was ulcerated and situated on the left side of the oral cavity, extending from the incisors and involving both the upper and lower jaws. The tumor was a

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moderately well-differentiated squamous cell carcinoma invading the bone."

Q. Doctor, did you find where the author said that that tumor could have been either spontaneous or induced?

A. I have not come across that.

Q. You were not aware that that was said in the paper?

A. Yes. Should I read that total paragraph?

Q. Yes, please, if you would.

A. This is in the discussion part of this paper where the author is getting the opinions about the results.

"This study has shown that exposure of rats to snuff for 10 to 16 hours a day, five days a week for most of their life span results in lesions mainly restricted to the epithelium and connective tissue of the test canal. One rat developed a squamous cell carcinoma of the buccal mucosa. This tumor may be spontaneous or induced. It appears the spontaneous tumors of the oral mucosa are extremely rare, as in five studies comprising approximately 1,900 Sprague-Dawley rats, only one spontaneous tumor was reported to occur in the oral cavity. The possibility that the present tumor was induced by

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snuff therefore cannot be completely ruled out. Axell et al. calculated the association between oral cancer and snuff-dipping in Sweden and found it to be 0.5 per 100,000 male snuff dippers. The tumor incidence in this experiment may accordingly be expected to be very low in view of the limited number of animals used."

Q. So the author did find that those could have been spontaneous tumors; is that correct? That was his opinion?

A. He said it could have been spontaneous --

Q. Yes.

A. -- but the possibility that it was induced by snuff cannot be completely ruled out.

Q. Well, I didn't say he ruled it out. He said it could have been spontaneous?

A. It could have been spontaneous.

Q. Right. Any of those other papers that you are familiar with at all?

A. No. I might have read at one time the 1976 paper of Homburger a long time ago, because I visited Doctor Homburger's laboratory once in which I was a part of a committee that was reviewing his -- but I don't remember.

Q. Excuse me?

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A. And I might have read that particular paper at that time, but I don't remember it.

Q. Doctor, what I was going to say, you need to get that microphone closer to your mouth. I am having a hard time hearing you.

Doctor Lijinsky, I refer you to the bottom of the page on that particular article under the heading of "Carcinogenesis."

A. Yes.

Q. If you will look at it, you will see that this is Doctor Winn's paper that was delivered at Banff.

A. Yes.

Q. You attended. Are you aware of that?

A. Yes.

Q. And in her paper she said, "In the past researchers have been -- " Excuse me, I will start over.

"In the past researchers had been unsuccessful in inducing oral tumors in laboratory animals by exposing them to snuff and chewing tobacco."

Is that correct?

A. You read it correctly, yes.

Q. All right. Do you remember her saying that?

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A. I really -- I really don't. I don't remember very much about her presentation.

Q. All right, sir. Now, you testified with regard to the statement, I believe it was from IARC, concerning that in the absence of epidemiology establishing it, that a substance that was carcinogenic in laboratory animals had to be regarded as if it were carcinogenic in humans. Is that correct? Do you recall?

A. May I look at the exact phraseology?

MR. BRALY: It is in Volume 17, I think, right there in front of you.

THE WITNESS: Yes.

MR. BRALY: If I can help, Doctor Lijinsky, I think it at the section of the Nitrosomorpholine or Nitrosonornicotine. It may be marked with tabs.

THE WITNESS: Oh. I was looking in the preamble. It says -- May I read it again?

Q. (BY MR. JENNINGS) Please.

A. Yes. "Evaluation: There is sufficient evidence for a carcinogenic effect of N-nitrosomorpholine in several experimental animal species. Although no epidemiological data were available, N-nitrosomorpholine should be regarded for practical purposes as if it were carcinogenic to

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humans."

Q. Regarded as if it were?

A. As if it were.

Q. Without any proof that it must be, but it must be regarded as if it were for practical purposes; is that right?

A. Yes.

Q. That is not scientific evidence that it is carcinogenic, is it?

A. It amounts to the same thing.

Q. It does?

A. Yes.

Q. You are going to treat something as if it were carcinogenic and that means you have proved it is carcinogenic?

A. Proof might be very difficult to obtain without doing experiments in humans which we do not -- which we proscribe. I don't think anybody would suggest that we should do experiments in humans to find out if a chemical which is shown to be toxigenic in animals would cause cancer in humans.

Q. I certainly didn't wish to make that suggestion.

A. It sounded like that.

Q. Well, I didn't intend to, Doctor Lijinsky.

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I thought we all agreed that epidemiological studies were the way that you supply the missing proof if it was available. I thought you agreed to that yourself.

A. Rigorous scientific proof in the case of carcinogens is very difficult to obtain for human exposures unless in some way a deliberate exposure of people is being made to the carcinogen.

Q. Nobody is suggesting that that would be done, I assure you that.

A. No, I'm sure you don't believe that that should be done.

Q. Thank you. Do Fisher rats develop tumors spontaneously if they live long enough?

A. Yes.

Q. That was a statement that you made, wasn't it?

A. They do develop several kinds of tumor.

MR. BRALY: Excuse me one moment, Your Honor. Apparently Mr. Jennings is going to read a statement from his deposition. The witness has already said he agrees to it. That's improper use of the deposition. If he has contradicted himself, that is a different matter.

THE COURT: I am not sure what he is

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prepared to do.

MR. JENNINGS: I am asking if he made that statement, if they live long enough.

THE WITNESS: May I see the statement?

Q. (BY MR. JENNINGS) Yes, sir, have you got the deposition, Page 64?

A. Which page?

Q. 64. Excuse me.

A. 64. Yes.

Q. Why did you say if they live long enough?

A. Because the spontaneous tumors that appear in Fisher rats usually appear in the later part of life.

Q. Just like cancer in human beings?

A. These spontaneous tumors are almost certainly not produced by exposure to a carcinogen in these Fisher rats. They are not unusual tumors; they are very usual tumors. Almost all Fisher rats, which is the strain of rat I work with, develop some kind of tumor towards the end of their life, approximately two years of age, and these are all tumors of the reproductive system or of the endocrine system.

Q. Do they ever develop tumors spontaneously over the oral cavity?

A. Very, very, very rarely. I wouldn't say I

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have never seen one.

Q. But it does happen?

A. It does happen.

Q. I thought you testified, and correct me if I am mistaken, that there are fewer than a hundred nitrosamines that exist in nature. Am I mistaken about that?

A. Is that in here?

Q. Yes.

A. What page?

Q. Page 76.

A. 76. Can I -- you asked me are there many nitrosamine compounds, or Mr. Finnegan asked me, are there any nitrosamine compounds.

Q. Yes.

A. "Is that a large category?"

And I said, "Yes, that's a large category."

Then the question: "Generally how many nitrosamine compounds are there?"

And I answered, "Well, there's theoretically no limit to the number you can make.

"Question: I see. You can synthesize them?

"Answer: Yes, of course.

"Question: But how many would you say

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existed in nature?

"Answer: Well, --

"Question: I am not asking you exact. I am asking you are we talking about ten, 20, a hundred, or what is the order of magnitude?"

And I answered, "I would say fewer than a hundred."

Q. That's what I thought you said.

A. Yes, sir.

Q. Now, is that correct?

A. Yes.

Q. The others that you have talked about I think you say you tested 165.

A. Yes.

Q. Those are not all nitrosamines that appear in nature; those are nitrosamines that have been synthesized in the laboratory?

A. Yes, but they include several that have been found in nature.

Q. Oh, I'm sure of that. But the reason in the discrepancy in the numberthat you tested and the amount appearing in nature because you in the laboratory can create as many nitrosamines as you can find amines for nitrosamines; am I --

A. Theoretically that's --

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Q. All right. Did you say in your deposition that most, if not all, nitrosamines have specific target organs? I refer you to page 117. The bottom of Page 117 and on to 118.

A. It appears -- the question was asked is -- well, I have to go back a little way.

Q. Go ahead.

A. "Question: Do all nitrosamines have target organs? Is that a property of nitrosamines in general?

"Answer: Could you -- I think I know what you mean, but I would like you to rephrase the question, if you could." That's my answer.

"Well, what I am trying to find out is if -- Is it is a general -- is it a general characteristic of nitrosamines that any particular nitrosamine has its own target organ?

"Answer It might share that target with other nitrosamines, but --

"Question: I didn't mean to say it was a unique target organ.

"No. Okay. I think what you mean is that does it induce tumors of a particular kind rather than just induce tumors all over the shop.

"Question: That's right.

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"Answer: Is that what you mean?

"Question: That's what I am asking, and if you would, comment on that and explain it.

"Answer: It appears that most, if not all, nitrosamines have specific target organs. There might be several.

"Question: Okay. I understand. It's not a particular target organ, but it will be particular target organs?"

I don't know what that means.

Q. But it will be target organs is what you mean?

A. It will be a particular target organ. I misread that. I apologize.

Q. That's all right. So that was your testimony; is that correct?

A. Yes, that's what I said.

Q. Most, if not all, nitrosamines have specific target organs?

A. In that particular species.

Q. In a particular species.

A. Yes.

Q. By that you mean it might be different in another specie?

A. It might be or might not be. It could be

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different.

Q. It could be different.

A. (Nodding yes).

Q. As a matter of fact, it could be that it wouldn't produce tumors at all in another specie; isn't that true?

A. In the case of a nitrosamine, that's highly unlikely, as I said earlier, because nitrosamines are -- have the characteristic, they have not been identified resistant species yet.

Q. Do any of them not produce cancers or tumors in some species but do in others?

A. In my own experiments, I think there have been two cases, maybe only one case, the second is debatable, but there might be one case in which a nitrosamine that was carcinogenic in rats and hamsters was not carcinogenic in guinea pigs, but there is always a possibility in such a case that I simply didn't give enough dose to the animals to produce tumors, because they might have been -- because of biological variation between one specie and another in activation, it might be necessary to give a higher dose of that particular carcinogenic nitrosamine to that particular species to get tumors within the -- not within the life span, but within

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the time that I can observe the animals.

Q. Have you tested any tobacco-specific nitrosamine other than NNN?

A. Not in the category that -- that Hecht and Hoffmann put tobacco-specific nitrosamines, that is, those three or four compounds they talk about commonly.

Q. But NNN is the only one you have tested?

A. NNN is the only one of that group that I have tested it.

Q. And you tested it in what animal?

A. In rats.

Q. And only rats?

A. Only in rats, and only one dose.

Q. And what was the target organ in that test?

A. The nasal cavity.

Q. No other?

A. I would really have to look at the paper. That was -- that paper was actually written while I was away in Germany by two colleagues of mine who worked with me. They did -- they wrote up the study and they published the paper, and I don't recall precisely, because I didn't write it, I don't recall precisely what they found. I think mainly nasal cavity tumors.

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Q. Well, very quickly, if you look at Page 128, Line 11, "Were there any other target organs for NNN?

"Answer: Not in our study."

A. Yes.

Q. All right, sir. Does that refresh your recollection?

A. I might have been precipitant in saying that, because I have not just read the paper to find out whether that was correct. I couldn't recall from what I remembered whether there were any other tumors, but I certainly wouldn't exclude the possibility. I would like to be able to read the paper.

Q. As far as you recollect now, there is no other target organ?

A. The main tumors were certainly tumors of the nasal cavity that killed the animals.

Q. Doctor Lijinsky, you do know that human beings get cancer of the tongue who have never used tobacco, don't you?

A. I've heard it said that there are humans who have cancer of the tongue who as far as we know never used tobacco.

Q. Do you have any difficulty believing that?

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A. I beg your pardon?
Q. Do you have any difficulty believing that?
A. No.
Q. Do you have any idea what causes the tongue cancer in the cases of people who have never used tobacco and have tongue cancer?
A. There are other carcinogenic agents that might have the tongue as their targets.
Q. Tell me what they are.
A. I don't know. I said there might be --
Q. Oh.
A. -- other agents.
Q. Do you have any knowledge of any of the causes of tongue cancer in people who do not use tobacco?
A. No.
Q. How about alcohol?
A. I don't think the evidence is good that alcohol by itself is a carcinogen at all.
Q. Had you ever used tobacco?
A. Personally?
Q. Yes, sir.
A. Yes.
Q. Do you use it now?
A. No.

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Q. How long has it been since you have used it?

A. Since I have used it at all, I used to be a cigarette smoker and the first date of giving up smoking is to stop buying, so 20 years ago I stopped buying cigarettes and about 15 years ago I quit smoking them, too.

Q. I understand. I know how that goes, Doctor Lijinsky. Thank you, sir.

THE COURT: Redirect.

REDIRECT EXAMINATION

BY MR. BRALY:

Q. Doctor, 20 years ago would have been when?

A. 1966, thereabouts.

Q. About a year or so after the Surgeon General of the United States issued a somewhat famous report about the hazards of smoking and lung cancer?

A. I think that was 1964, yes.

Q. Did that have any influence on you as a scientist?

A. Yes, it confirmed for me what I long felt, that smoking cigarettes was not a healthy thing to do. Enjoyable, but not healthy.

Q. Is there any doubt in your mind or the scientists that you work with that smoking cigarettes causes lung cancer?

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MR. JENNINGS: If the Court please, we are not trying a lung cancer case.

THE COURT: Sustained.

A. No, there is no doubt in my --

THE COURT: I sustained the objection.

THE WITNESS: Pardon?

THE COURT: I sustained the objection.

THE WITNESS: All right.

THE COURT: The jury will disregard the answer.

Q. (BY MR. BRALY) Doctor, I have asked you about a bunch of animal molds for exposure to solid forms of tobacco?

A. Yes, sir.

Q. Is it surprising to you in the least way that scientists have not been able to teach a rat or hamster or even a monkey to keep a pinch between its cheek and gums and we are shown as humans do on television?

A. No, it doesn't surprise me that it is difficult.

Q. Did they have the same problem finding animal models and finding the animal that they could teach to smoke?

A. That's -- that's probably true. Some have

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said rats, unlike humans, have more sense.

Q. Is it in general difficult to teach animals to use tobacco in the way humans do?

A. Yes.

Q. Now, according to your understanding, Sean Marsee used snuff for about six years?

A. Yes.

Q. Is it possible that those hamsters up there used snuff for six years?

A. They couldn't. They don't live six years.

Q. Is it possible that the rats use snuff for six years?

A. No. They couldn't possibly. Rats, the life span of rats under normal conditions is about two-and-a-half to three years.

Q. What about the mouse? Does the mouse hold a pinch between its cheek and gums for six years?

A. No. Mice live only two years approximately.

Q. Other than hamsters, rat, mouse, hamster, -- there's a monkey, a study done by Doctor Smith in 1970. Do you see that?

A. Yes.

Q. Do you know how long that monkey kept the snuff in his mouth?

A. No, no, I have no idea.

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Q. There was only 12 of them; is that right?

A. Yes, there were 12 monkeys it says, yes.

Q. Even if they kept it there six to ten years, the negative results wouldn't establish anything, would they, compared to the use of snuff by humans?

A. Not if it was a single package of snuff that was put there once and not replaced.

Q. Even if they replace it, they put an appliance in the mouth and change it a few times a week, wouldn't the fact that there were just 12 animals and no controls in the experiment, would that give you any reliable information?

A. It is not a very good experiment, let's put it that way.

Q. If you found out that the tobacco company and the tobacco company's lawyers went in and hired Doctor Smith in 1969 to do this study, would that cause you to cast any further doubt on that study?

A. It might make me suspicious, but I wouldn't jump necessarily to any strong conclusion without meeting Doctor Smith and reading his paper.

Q. If they failed to disclose in a published report where the funding from this data had come, would you find that unusual?

A. Yes, I would.

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Q. Is that something that good scientists routinely do?

A. Good scientists routinely --

Q. Disclose the source --

A. -- state --

Q. -- of the funding?

A. Yes. It's supposed to reflect well on the organization that funds the research.

Q. Doctor Lijinsky, how many articles have you published in the literature?

A. I think I have about 340 up to now.

Q. Does it come as any surprise to you that this defendant in this lawsuit with the resources that it has can find seven or eight articles with which to extract very short passages from various paragraphs within the interior of those articles to quote back to you during your cross-examination?

A. No.

Q. When Mr. Jennings first started cross-examining you prior to the lunch hour, he was having you read from a study by Doctor Hecht and others, including Doctor Hoffmann, where they had painted the mouth of certain laboratory animals with NNN and NNK. Do you recall that?

A. Yes. The unpublished manuscript.

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Q. The one --

A. Yes.

Q. -- that is present and been accepted, but still unpublished. Let me, if I can, hand you another copy of that.

A. Thank you.

Q. Doctor, before we turn to that one, you also recall being asked questions about Doctor Hirsch's studies --

A. Yes.

Q. -- where he had developed this process of doing a lip canal surgery, where they make a little canal in the lip of the rat -- excuse me Maynard, I am sure you would understand that -- are you aware that in 1984 Doctor Hirsch published a study in the Journal of Oral Pathology, is that a reputable journal, the Journal of Oral Pathology?

A. It is not one that I usually refer to, but as far as I know, it is a reputable journal.

Q. Being used by oral pathologists?

A. Yes, I assume.

Q. Are you aware that in that study where he reported on the effects of this that he said, and I quote from the abstract, "The incidence of malignant tumors was significantly higher in rats exposed to

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snuff or HSV-1 and snuff in combination than in control animals."

A. Yes, I --

Q. Mr. Jennings didn't call your attention to that one, did he?

A. No.

Q. And Doctor Hirsch lists a p value, says p less than 0.05. That is considered to be statistically significant.

The next sentence says, "The results of the study indicate that HSV-1 in combination with snuff exposure may be associated with the development of squamous cell carcinomas of the oral cavity."

Also while we are talking about that, have you read Doctor Park's deposition where he talks about his experiment?

A. Yes.

Q. I believe Mr. Jennings asked you about that, didn't he, Doctor Park's work?

A. I don't think he asked me about the deposition, but he asked me had I --

Q. Were you familiar with --

A. If I was familiar with Doctor Park's work. I think, but I'm not sure.

Q. Have you read Doctor Park's deposition?

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A. Yes, I did.

Q. Did he get squamous cell carcinomas of the oral cavity in his rats that had been exposed to snuff and herpes virus?

A. He did.

Q. Did he get any cancers in those that had just been exposed to herpes virus?

A. No.

Q. Now, looking at the paper from Doctor Hoffmann and Doctor Hecht from which Mr. Jennings read small portions or had you read small portions. I call your attention to the abstract on Page 1.

A. Yes.

Q. Would you just read the abstract to the jury, please.

A. From the beginning?

Q. Yes.

A. "The tumorigenic activities toward the oral cavity of snuff, its extracts and two of its major nitrosamines, N-nitrosonornicotine, NNN, and 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK) were evaluated in male F344 rats. In one protocol, groups of 21-30 rats were treated beginning at age 10 wseeks by chronic oral application for 131 weeks of either H20, an H20 extract of snuff enriched with ten

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times its indigenous concentration of NNN and NNK, or with NNN and NNK in H20. The incidence of oral cavity tumors in the rats treated with NNN and NNK was 8/30, compared to 0/30 in controls (p value than 0./05).

Q. Let me stop you a minute, Doctor. Can you recall Mr. Jennings asking you to read that portion where it says that eight out of 30 of the rats that were treated with NNN and NNK came down with oral cavity tumors? He didn't ask you to read that, did he?

A. He did not ask me that.

Q. What does that p value mean, where it's p less than .05?

A. It means strictly that if the experiment were repeated a hundred times, this would -- this result would be obtained by chance less than five times out of a hundred times. That's what the p value means.

Q. This resulted in a contrary result, would be obtained five times?

A. I'm sorry, the contrary result will be obtained less than five -- well, I really said the same thing. That the result would have happened by chance less than five times out of a hundred.

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Q. Does that mean that the results are real?

A. It means -- it means you can have 95 percent confidence in the results which represent a cause and effect relationship. That is, the result they obtained was due to the treatment and not by chance.

Q. And again how many of the animals that had their mouths with the NNN and the NNK, how many of the 30 had tumors?

A. Eight.

Q. And how many of the control animals that had their mouths painted with water?

A. Zero out of 30.

Q. Would you read the next sentence, please.

A. "These results demonstrate that NNN and NNK can induce tumors locally in the oral cavity of F344 rats. Oral cavity tumors were also observed in three out of 30 rats treated with snuff extract enriched with NNN and NNK, but not in the rats treated with snuff extract alone."

Q. Okay. Let me stop you there. Go ahead.

A. "In the second protocol a test canal was surgically created in the lower lip of groups of 21 to 32 rats --

Q. Excuse me a second. Doctor Lijinsky, you said in the second protocol?

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A. Yes.

Q. Is this another experiment that is reported within the same paper?

A. It is another experiment.

Q. It is reported in the same paper?

A. Yes.

Q. All right. So tell us again what happened in this second experiment.

A. "In the second protocol a test canal was surgically created in the lower lip of groups of 21 to 32 rats, and either snuff, water-extracted snuff or snuff enriched with its own water extract was inserted in the test canal five times weekly for 116 weeks. A group of ten control rats had surgery only. Among the 32 rats treated with snuff, three had oral cavity tumors."

Q. Excuse me. Are you aware of any oral cavity tumors that occurred in the ten control animals?

A. It doesn't say so.

Q. All right. And how many did you have among the 32 rats that just got snuff in the mouth?

A. Three.

Q. All right. Proceed.

A. "One was a squamous cell carcinoma, originating in the test canal and invading the

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gingiva. One was a papilloma of the test canal, and one was a papilloma of the hard palate. Oral cavity tumors were also observed in two out of 21 rats treated with water-extracted snuff and one out of 32 rats treated with snuff enriched with its water extract. Oral tumors were not observed in control rats."

Q. Stop there a second, and let's add this up a little bit. We have got one of the rats was treated with enriched snuff, two of the rats were treated with the extracted, water-extracted --

A. Yes.

Q. -- a total of three, and then three more that just had the snuff.

A. Yes.

Q. That had tumors; is that correct?

A. That's -- yes, a total of six animals.

Q. A total of six. And the total there we got 32 and 21, would be what, 53, and another 32, would be about --

A. Yes.

Q. -- 84 animals.

A. Yes.

Q. And 84 of these animals that had snuff in the mouth got tumors -- excuse me, six?

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A. Six out of the 84.

Q. Six out of the 84 got tumors in the mouth?

A. Yes.

Q. Did any of the other control animals get tumors in the mouth, animals that didn't get snuff in the mouth?

A. It says that oral tumors were not observed in control rats.

Q. Would you read the last sentence, please.

A. "The results of this study indicate that snuff and individual nitrosamines present in the snuff can induce oral cavity tumors in F344 rats and support the epidemiological observations which indicate that snuff-dipping causes oral cancer in man."

Q. Doctor, in your opinion is this as close as anybody has ever got to teaching a rat to keep a pinch between his cheek and gum?

A. I think so.

Q. Doctor, I am not quite sure how to ask the next question, but let me do the best I can. Mr. Jennings asked you over and over again about epidemiological studies in relation to nitrosamines. He also asked you about Doctor Winn's study. Now, is there any group of people out there that scientists

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have identified as in fact having significant exposures to nitrosamines that are just walking around out there, groups of people, large groups of people?

A. These people who use tobacco.

Q. Have there been any epidemiological studies among those people that have shown an increased risk of getting cancer of the mouth from dipping snuff?

A. Yes.

Q. And that is Doctor Winn's study for one?

A. Doctor Winn's study.

Q. Others from around the world?

A. Yes.

Q. I believe Doctor Hecht mentioned the presence of polonium.

Do you know of any other carcinogenic substances in snuff in significant quantities besides the nitrosamines?

A. Not that I know of.

Q. Do those studies among snuff dippers constitute epidemiological studies of a nitrosamine exposure to confirm the work that you have done with nitrosamines in animals?

A. I think that's exactly what they show, they are epidemiological studies of cancer in humans

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exposed to nitrosamines.

Q. And the nitrosamines exposure came as a result of the advertising and sale of snuff to unsuspecting consumers?

A. I would --

MR. JENNINGS: If the Court please.

A. Yes.

MR. JENNINGS: I object to the form of the question.

THE COURT: The question has been asked before. Sustained.

MR. BRALY: Just one second, Your Honor.

Q. (BY MR. BRALY) Doctor, Mr. Jennings asked you about this Ames test.

A. Yes.

Q. Do you remember that? Are you aware that September of 1984, United States Tobacco Company finally got around to causing an Ames test to be run on Copenhagen Snuff?

A. I think I heard about that.

Q. Have you seen that document?

A. May I see it to refresh my memory?

Q. Surely.

MR. BRALY: Your Honor, it has been marked as an exhibit to Doctor Manning's deposition. I do

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not have the exhibit number handy.

Q. (BY MR. BRALY) Look at this page. That is the conclusion.

Q. Have you seen that study before, Doctor, had a chance to look at it?

A. I don't remember whether I saw it or not.

Q. Doctor, you need to check your memory. That was part of what we spent that four hours talking about last night.

A. Oh, okay.

Q. Let me ask you to read the conclusion.

A. Yes, I think -- yes, I remember seeing -- seeing the document, but I don't remember whether I read it only.

Q. Would you read the title?

THE COURT: Before you do that, let's get a number to this and any objection to Plaintiff's whatever it is?

MR. JENNINGS: No, Your Honor.

THE COURT: All right.

MR. BRALY: Your Honor, just one second. I think I can get you a precise number for it. My efficient help back here tells me it is 68-C.

THE COURT: All right. Plaintiff's 68-C will be admitted.

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Q. (BY MR. BRALY) Would you read the title, please?

A. "Salmonella/Mammalian-Microsome Plate Incorporation Mutagenicity Assay (Ames Test) U.S. Tobacco Company Test Article Copenhagen Snuff."

Q. What is the date on that on the next page?

A. The 22nd of August, 1984.

Q. Okay. Would you read the conclusion if you can find it.

A. Conclusions on Page 2. "The results of the Salmonella/Mammalian-Microsome Mutagenicity Assay indicate that under the conditions of this study, U.S. Tobacco Company's test article Copenhagen Snuff (MA #T2533) did cause a positive dose responsive increase with tester strain TA1535 both in the presence (6.1-fold increase) and absence (2.9-fold increase) of exogenous metabolic activation."

Q. Thank you, Doctor. Does that mean that according to the Ames test Copenhagen Snuff is mutagenic?

A. It does.

MR. BRALY: We would move the admission of the exhibit, Your Honor.

THE COURT: It's admitted. But don't run off with it unless you are going to use it again.

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MR. BRALY: I am not going to, I promise you.

That's all I have, Your Honor.

THE COURT: Further questions, Mr. Jennings?

MR. JENNINGS: Yes, Your Honor.

THE COURT: Let's go ahead and take a recess. We will take a 20-minute recess, ladies and gentlemen, with my usual admonitions.

Everyone remain while the jury exits for 20 minutes. You will be excused.

(The following proceedings were had out of the presence and hearing of the jury.)

THE COURT: Mr. Jennings, plaintiff offered into evidence or reoffered again, I don't remember the number, but the chart dealing with --

MR. BRALY: 230, Exhibit 230.

THE COURT: -- the comparison of NNN and NNK to NNDA, I believe.

MR. BRALY: NDMA.

THE COURT: And you mentioned that you had wanted to cover that again, and maybe you have and I have missed it, but I assume he is going to reoffer that at the conclusion of this witness's testimony. I just wanted to mention that to you again.

MR. JENNINGS: If the Court please, we still

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contend that it is not admissible. It is misleading, in that the --

THE COURT: I understand that. My question was, though, this witness has testified that NNN and NNK were comparable in toxicity to the NMDA, which I don't believe the other witness has testified to that, and I am not saying that makes a difference, but he has said that. You might want to explore that.

MR. JENNINGS: If the Court please, I want to point out that he concedes that the figures that he arrived at from the use of the materials from which that chart were taken gives him an exaggerated figure on the number of kilograms per gram in the dose of Sean Marsee. That's 16.6 he has conceded is an exaggerated figure.

THE COURT: I am really not telling you that I am going to submit the document. I am just saying explore that further, that was his testimony.

MR. JENNINGS: I understand.

THE COURT: Court will be in recess.

(A brief recess was here had.)

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(A brief recess was here had.)

THE COURT: Be seated.

Q. (BY MR. JENNINGS) Doctor Lijinsky, the suggestion was made when I was reading to you from the Hecht-Hoffmann paper, the unpublished paper that I did not read about the eight tumors in the 30 animals that received the NNN and NNK. Do you remember that question?

A. Yes.

Q. Was that correct, I didn't read to you about that?

A. I can't remember, I'm afraid.

Q. Did I not read to you from Page 11, the specific language "whereas, the instance of oral cavity tumors was eight out of 30 in the rats treated with NNN and NNK, it was only three out of 30 in the rats treated with snuff extract enriched with NNN and NNK," I didn't read that to you?

A. I'm hard pressed to remember, Mr. Jennings, but I just can't -- I just read that -- one of those paragraphs with Mr. Braly, and I don't remember whether you read it to me or not. I rather think that you did read something from Page 11, but I can't be -- I can't be certain --

Q. Thank you.

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A. -- of that. I think you did.

Q. Thank you, sir. Now, did Doctor Park in his experiment get any tumors in any of the rats that were given only snuff?

A. I don't remember. I'd have to read his deposition.

Q. All right. You don't remember that?

A. I don't.

Q. Were the tumors that were referred to in the Hecht paper the three tumors in the second group, the second set? Do you know what I am talking about?

A. I beg your pardon?

Q. The Hecht --

A. Yes.

Q. -- paper that has not been published, --

A. Yes.

Q. -- Mr. Braly read to you about getting three tumors with the snuff implanted in the canal.

A. Yes.

Q. Do you remember that?

A. Yes.

Q. Were those tumors statistically significant?

A. According to Doctor Hecht, this difference was not statistically significant, but taken together with the negative results obtained in the animals

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swabbed with snuff extract only, it suggests that NNN and NNK were less tumorigenic -- no, that's the wrong excerpt I was reading.

Q. Let me direct your attention to Page 13.

A. 13.

Q. That is where he is discussing the three tumors. Incidentally, two of those were papillomas, were they not?

A. About half way down the page, "In the present study..."?

Q. Yes.

A. In the -- "In the present study one rat had a squamous cell carcinoma of the test-canal invading the gingiva, one rat had a papilloma of the test-canal, and one rat had a squamous cell papilloma of the hard palate, among the 30 rats treated with snuff."

Q. Now, those two papillomas are not cancer, are they?

A. They are a stage in the formation of cancer --

Q. Papilloma is not a cancer, is it, Doctor Lijinsky.

MR. BRALY: Excuse me, Your Honor, excuse me. The witness was trying to answer the question.

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I think he ought to be allowed to answer the question.

THE COURT: Go ahead.

Q. (BY MR. JENNINGS) Is papilloma a cancer?

A. Papilloma is a benign tumor but is a response to feeding with a carcinogen, not --

Q. Is a benign tumor a cancer?

A. According to the dictionary definition, it is not a cancer, but cancer to a experimentalist like me is not a very useful word, because it divides two stages of the same phenomenon which is the induction of tumors. It's how you use the word,"cancer." I know it has a dictionary definition.

Q. Benign tumors do not metastasize, do they?

A. No.

Q. They do not invade into the --

A. They do not invade.

Q. They are not life threatening, are they?

A. Oh, they can be. Some of the papillomas I get in my animal experiments kill the animals, if they are in the trachea, papillomas in the trachea, papillomas in the esophagus frequently kill the animals.

Q. Are papillomas in human beings life threatening?

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A. I don't know. I am not a clinician.

Q. All right, sir. Go ahead now. Were those three tumors statistically significant?

A. In the present study -- sorry. "While this incidence rate was not statistically significant compared to controls, the occurrence of spontaneous tumors of the buccal mucosa or tongue in F344 rats is so rare that it can be considered practically zero percent. Taken together with the results from groups 3 and 4, in which oral tumors were observed in 3 rats, these findings strongly indicate that these tumors were induced by snuff and were not fortuitous occurrences. In addition," -- the oral cavity -- "the oral tumors originated in the squamous epithelium, as observed in man.

So Doctor Hecht is saying that although mathematically, statistically, they were not stastically significant, not mathematically significant, they were to him significant.

Q. But they were not statistically significant?

A. That's what he -- he said they were not statistically significant.

Q. All right.

A. But they were significant.

Q. Have you seen medical records on Sean

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Marsee?

A. I think I saw -- I did see a two-page description of his -- one state of his examination.

Q. That is the extent of your knowledge of his medical record?

A. That's the extent of my knowledge.

Q. All right, sir. Let me ask you if you have ever seen this paper.

A. I don't recall ever seeing it.

Q. Mr. Braly didn't show you that paper last night, did he?

A. No, I don't remember seeing it.

Q. Do you recognize what it is?

A. This letter constitutes -- its from the Southern Research Institute from Birmingham, Alabama, signed by Chairman William Suling, Ph.D., Senior Microbiologist, Microbiology Virology Division.

Q. Does it report on an Ames test?

A. Yes, this letter constitutes -- may I read part of it?

Q. (Nodding yes).

A. "Dear Doctor Hoff. This letter constitutes our final report on the assay of aqueous extracts of two samples of smokeless tobacco --

THE COURT: Slow down.

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THE WITNESS: I'm sorry.

"This letter constitutes our final report on the assay of aqueous extracts of two samples of smokeless tobacco for mutagenic activity, using the Salmonella/Mammalian-Microsome mutagenicity test (Ames test) -- in brackets -- our results indicate that the aqueous extracts possessed no apparent mutagenic activity for any of the tester strains under the experimental conditions that were used."

Q. That was a negative test, was it?

A. They said that they found no -- no mutation, presumably.

Q. That was Copenhagen Snuff?

A. Copenhagen smokeless tobacco and Skoal smokeless tobacco were purchased wholly, 15 --

Q. What date was that?

A. May the 24th, 1984.

Q. But you hadn't seen that paper before?

A. No, I had not.

Q. Did you read all of Doctor Park's deposition?

A. I did -- I read it all, but I certainly don't remember it all.

Q. Do you remember whether or not he said that "no animal studies have demonstrated neoplastic

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changes in the oral mucosa after repeated application of the tobacco combustion products or snuff"?

A. I don't remember. May I see it?

(Handed to the witness)

A. Thank you.

A. May I read the question preceding it?

Q. Sure.

A. "Question: I will ask you to refer with me to a sentence that appears in that paper."

And he's talking about the paper on Oral Pathology, February, 1985, Volume 59, No. 2, and I will ask you to refer with me to a sentence that appears in that paper, beginning with "however."

"However, no animal studies have demonstrated the neoplastic changes in the oral mucosa after repeated application of tobacco combustion products or snuff.

"Question: You made that statement in that paper?

"Answer: Yes.

"Question: And is that statement true?

"At that time, it was true, and then later I found out that there is one single report from

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Hirsch in Sweden. He applied the snuff in the oral cavity of rats for 18 months, almost a lifespan, and then, from one animal, he observed oral cancer, and in control animals, which is not treated at all, no virus or no herpes virus or no tobacco, 18 in control groups had neoplastic changes in all animals. I believe because of the-- they kept the animals for the life span."

Q. Do you recall that testimony from the deposition?

A. Yes, now I remember reading that.

Q. Do you know whether or not the Winn Study shows any increased relative risk of tongue cancer from the use of snuff?

A. I don't -- I don't remember it saying that there was an increase in the relative risk of tongue cancer, but I would have to read the paper again.

Q. Do I understand correctly from your testimony today, Doctor Lijinsky, that different nitrosamines act differently with regard to different species of animals, laboratory animals?

A. They can act differently. They don't necessarily act differently.

Q. But they can and do at times?

A. Yes, some do sometimes.

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Q. You can't predict from testing one nitrosamine what is going to happen with regard to another nitrosamine; is that correct?

A. In a given species?

Q. In a given species.

A. I think with my background and experience, I could probably make some fairly accurate predictions about where a given, -- a nitrosamine of a given instruction would produce cancer or tumors in rats, for example, based on analogy with other similar structures.

Q. How about in a different specie?

A. That's more difficult, although there are again patterns, certain types, nitrosamines of certain structures tend to produce certain types of tumor in a given species, so we can all you have our background information make some prediction, when we have enough information.

Q. You can make a prediction which might turn out to be entirely wrong; is that right?

A. It might, but it becomes increasingly less likely as we learn more.

Q. Thank you.

REDIRECT EXAMINATION

BY MR. BRALY:

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Q. Doctor Lijinsky, did he hand you exhibit or an unmarked exhibit, being another document about the Ames Test from Southern Research Institute?

A. Yes.

Q. You have got an airplane to catch this afternoon don't you?

A. Yes.

Q. I am going to try and be brief. This was one that was earlier than the Ames Test that you referred to that was marked as Plaintiff's Exhibit 68-C, right?

A. I forget the date on that.

Q. All right. If I can refresh your memory, how about August of '84?

A. Yes.

Q. This was an earlier one?

A. Yes.

Q. I want to make sure you have got the same one that I have got.

A. Yes.

Q. It appears as though you do?

A. Yes.

Q. That was a negative result on an Ames test, wasn't it?

A. Yes.

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Q. You didn't get a chance to read the whole document, did you?

A. No.

Q. Let me call your attention, see if we can find a reason why it was a negative test contained in this document that Mr. Jennings just called to your attention. Would you look at Page 2.

A. Yes.

Q. Look down to the results of the discussion section.

A. Yes.

Q. Does it say there "no apparent mutagenic activity was observed with test samples C and S" and I understand those are Copenhagen and Skoal --

A. Yes.

Q. -- under the experimental conditions employed."

A. Yes.

Q. Would you read the next sentence to the jury?

A. "However, the highest amount, 1.0 milliliters of the test samples assayed had a level of microbial contamination to prevent an accurate counting of the*something something* rebutter /EURT colonies on these assay plates. Therefore the data

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from 1.0 milliliters are not presented in detail, also, the 1.0 milliliter volume of each test sample appeared to be toxic, to strains TA100 1535, TA98.

Q. What does it mean when it says they are toxic?

A. That meant they were killed -- they killed out bacteria, so whether --

Q. Poisoned them?

A. Pardon.

Q. Poisoned them?

A. Yes.

Q. So the Copenhagen poisoned the subjects of the tests?

A. Well, it has substances in it, nicotine is a -- and other substances are poisonous to bacteria.

Q. But there is something more important and that is the next paragraph. Would you read that?

A. "We recommend that mutagenicity assay be repeated, using aqueous extracts of tobacco, with a stabilized by filtration, in order to avoid the contamination problem and to confirm the negative results. CHECK QUOTES.

Q. So then this was in May, the document you got?

A. Yes.

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Q. So they did do it again, didn't they? They did it in August, didn't they?

A. That's not the same -- the same laboratory doing the experiment.

Q. Okay. It is true but they got the Ames test run again in August, didn't they?

A. Yes.

Q. And the results when they finally got it run right were?

A. They were positive.

Q. And positive means that Copenhagen snuff causes mutation; is that correct?

A. Yes.

Q. It is mutagenic?

A. Mutagenic.

Q. Doctor, among the other things I didn't show you last night is what has been marked as Plaintiff's Exhibit 263 to Doctor Manning's deposition. Would you read who the letter is from first.

A. It is from -- it is headed "U.S. Tobacco Intracompany Correspondence."

Q. What is the date on it?

A. June the 5th, 1984, from Richard E. Manning, Vice President, Research & Development, Nashville.

Q. Would you read the last paragraph on that

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page?

THE COURT: Before you do that, offer it in evidence.

MR. BRALY: Oh, sorry, Your Honor. It has already been marked marked and identified by Doctor Manning in his deposition, so we offer it in this case.

THE COURT: This is Plaintiff's 263.

MR. BRALY: Mr. Jennings,--

THE WITNESS: 263.

MR. JENNINGS: May --

THE COURT: Any objection?

MR. JENNINGS: May I see it for a moment, Your Honor?

(Handed to counsel).

MR. JENNINGS: No objection.

THE COURT: Plaintiff's 263 will be admitted.

Q. (BY MR. BRALY) Now, would you read that last paragraph on that letter back in June?

A. "Mutagenicity with this assay is reported by some investigators to have a high level, 72 to 91 percent of correlation of carcinogenicity. Other investigators say the test is meaningless -- that there are too many false" -- positives -- "too many

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false negatives," I'm sorry. "However, most toxicologists do seem to take note that when a material tests positive. As mentioned, there are many test protocols available and this test shows under this particular accepted protocol, these products are not mutagenic."

Q. That was back in June?

A. Yes.

Q. And that was referring to the defective test?

A. Yes.

Q. That had their contamination?

A. Yes.

Q. But since that time, they have got an Ames test and got it run right and it shows that it was mutagenic; is that correct?

A. Yes.

Q. Doctor, you have Doctor Park's deposition in front of you?

A. Yes.

Q. Would you turn to page --

A. No, I'm sorry I -- no, that is not Doctor Park's. No, I don't have it.

THE COURT: I will give you my copy.

A. Thank you.

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Q. Ask you to turn to Page 58.

A. Yes. Is it your understanding from what you read in this deposition that Doctor Park's research was funded by the tobacco company?

A. Yes, it is.

Q. Turning your attention to Page 58. Do you recall the following question and answer. "Doctor, my question, and now that you have given an explanation, my question is that in this manuscript which you are submitting over your signature for publication, you did make the statement, 'thus it would appear that almost anyone who engages in chronic snuff dipping might be a potential risk for the development of oral malignancies, whether or not they show recurrent manifestations of herpes simplex virus reaction.'" You made that statement. What was Doctor Park's answer?

A. "Yes."

MR. BRALY: Nothing further, Your Honor.

THE COURT: Anything further, Mr. Jennings?

MR. FINNEGAN: May I ask a question just from here?

THE COURT: Yes.

RECROSS EXAMINATION

BY MR. JENNINGS:

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Q. Did I understand you to say, Doctor Lijinsky, that snuff kills bacteria?

A. I would gather from that result that was presented in this paper in the comment that something in the snuff killed the bacteria on the plate.

Q. You don't mean it is antiseptic? I am serious about it.

A. I don't know whether I would go that far, but it --

Q. How could you ever run an Ames test if the substance killed the bacteria. Do you have to have the bacteria?

A. That is precisely what was wrong with that study, but maybe it was not the -- something in the snuff, but something else that they picked up in the laboratory.

Q. Right?

A. You are quite right.

Q. Thank you, Doctor Lijinsky.

RECROSS EXAMINATION

BY MR. BRALY:

Q. In any event, snuff didn't kill the bacteria in the second test, did they?

A. No.

MR. BRALY: They couldn't have run the test.

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And can this man catch an airplane?

THE COURT: Yes, you may step down and you are excused.

THE WITNESS: Thank you Your Honor.

THE COURT: Call your next witness.

MS. DESCHAMPS-BRALY: Your Honor, the plaintiff would call Doctor Thomas B. Balz by deposition.

(The Deposition of Thomas P. Balz, M.D., was here read to the jury.)

MS. DESCHAMPS-BRALY: Your Honor, at this point, I would ask that what was marked as Defendant's Exhibit No. 1 to this deposition be marked with an appropriate number as plaintiff's Trial exhibit --

THE WITNESS: 66-F.

THE COURT: That is the medical records?

MS. DESCHAMPS-BRALY: Yes, Doctor Balz.

THE COURT: Where is that?

MS. DESCHAMPS-BRALY: (Indicating) .

THE COURT: Why don't you get that and give it to Nancy. Any objection?

MR. JENNINGS: No, we have agreed to the introduction of all the medical.

THE COURT: All right. Plaintiff's 66-F

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will be admitted

Call your next witness.

MS. DESCHAMPS-BRALY: Your Honor, at this point, if it would be all right with opposing counsel and the Court, my suggestion would be we are planning to have the video deposition of Doctor Manning next. We can either start that now or go into the objections, whichever you prefer.

THE COURT: Why don't you come up for a moment.

(The following proceedings were had AT THE SIDE BAR.)

MR. FINNEGAN: Your Honor, if the Court please, we filed a response to Mr. Braly's motion this morning. I don't know if the court has had an opportunity--

THE COURT: I have not seen that, no.

THE COURT: I have read through about a third of this deposition. Do you want to reassert these?

MR. BRALY: That's our response to the motion, Your Honor, I filed it this morning. I'm sorry.. That looks like something else.

THE COURT: This is the plaintiff's response. Plaintiff's response to objections to --

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(Handed to the Court).

THE COURT: This is on the issue of notice.

THE CLERK: That's the only two things I have had. Let me go check. When was it filed today?

MR. FINNEGAN: Filed this morning.

THE CLERK: Okay.

MR. BRALY: It is my copy I gave you a little while ago.

(Handed to the court).

MR. FINNEGAN: That was done over the weekend, Your Honor.

THE COURT: Well, as I said, I read it and all I know to do is to go ahead and start on it and as you have an objection, just raise it. There are a lot of objections in there and many of which I can't tell you off the top of my head which ones I thought were relevant and a lot of them I did not think were relevant, but--

MR. FINNEGAN: If the Court please.

THE COURT: Go ahead.

MR. FINNEGAN: In the first 30 minutes or so, I believe that there is only three or four --

THE COURT: All right.

MR. FINNEGAN: -- objections which we would

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like to proceeds at this time.

THE COURT: Do you want to raise them here?

MR. FINNEGAN: If the court would like, we can do it here.

THE COURT: That's fine.

MR. FINNEGAN: If the Court please, Page 6, Lines 12 to 20, we felt that it was inappropriate for plaintiff's counsel to be commenting on the length of time that a witness was taking to answer. That was perfectly obvious on the tape. I think he was trying to search his memory and I believe we urged that Line 12 through 20, Page 6 be --

THE COURT: You are objecting to Line --

MR. FINNEGAN: Well, Page 6, lines 12 through 20, Your Honor.

MR. BRALY: Excuse me one moment, Your Honor, let me get a pad.

THE COURT: I will sustain that objection.

MR. FINNEGAN: Your Honor, our next --

THE COURT: It will speak for itself. If there is a long pause, it will speak for itself.

MR. BRALY: The problem is --

THE COURT: Let's don't even talk about it, let's go on, that is not enough to -- What's next?

MR. FINNEGAN: Page 20, Line 21, Your Honor,

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to --

THE COURT: 20, Line 21?

MR. FINNEGAN: Yes, Your Honor. To Page 21, Line 6. It is when Mr. Braly made a remark about his being hard of hearing. That is really an improper remark, just because he wasn't getting the answer that he might have expected or wanted to ask the witness if he is hard of hearing, the hearing problem we thought was uncalled for.

THE COURT: Well, I am going to overrule that. I frankly in reading this, I have trouble understanding why he didn't answer some of the questions, myself, better than he did, and I am going overrule that objection. On Page 20. Well, I will overrule that objection.

MR. FINNEGAN: Okay. Our next objection, Your Honor, is on Page 22, Line 1.

THE COURT: What excuse me.

MR. FINNEGAN: Line 1, it goes -- it goes all the way down to Page 24 at Line 9, Your Honor, it is the long questions and answers dealing with was he trying to be helpful, we believe that that is really argumentative and irrelevant to the issues in the lawsuit. This was whether or not he was trying to be helpful when he wrote a memorandum for Jurczenia.

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MR. BRALY: Your Honor, you have got to look at that the context, the witness will be kind of evasive. We put a document on the board that he had drafted and sent to one of the corporate officers, and I asked him if he was trying to be helpful to us or for the corporate officer, to help him understand the subject matter.

MR. FINNEGAN: And then on Page 23, Your Honor, we he asked him how many degrees he has.

THE COURT: Okay. I will overrule the objection on Page 22. 23 --

MR. FINNEGAN: Particularly 23, Line 8, over to 24. Page 24, Line 9.

THE COURT: What is your objection to that?

MR. FINNEGAN: What I object to, Your Honor, is that that wasn't a question which was really trying to get at the man's qualifications. I think it was an attempt to ridicule him because he didn't seem to have any information that Mr. Braly was looking for.

MR. BRALY: Your Honor, I asked him if he knew what the word "help" --

MR. FINNEGAN: I'm sorry. I didn't hear you, Mr. Braly.

MR. BRALY: I asked him if he was trying to

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be helpful with the information that he conveyed. I didn't get answers, I had to wait forever for it. The witness was being deliberately evasive, and when the witness finally said he didn't know what the word "helpful" means, I, you know, tried to put that in context to see if I could get the witness started to being cooperative. I did did that by asking how many degrees he had.

THE COURT: What troubled me when I read this is there were several times when this witness, if I remember right, the word "concept" was one that he was asked about and the word "helpful" he was asked about, some other, and I couldn't understand why he wouldn't give an answer to it, either. It struck me as being evasive and --

MR. FINNEGAN: Well, if the Court please, there was some questions here that he was asked that I believe are susceptible of several meanings. I think when he got words such as "safety," "dangerous," those words, Your Honor, which have lots of different meanings, particularly in the context of this lawsuit, given what our position is. And I think the witness was being careful not to try to use a word that is susceptible of many different meanings, he was looking for the question to define.

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that Mr. Braly didn't want defined, he wanted him to pick and choose on what definition to use, Your Honor.

MS. DESCHAMPS-BRALY: Your Honor, I had attached to the copy of the brief that we presented to you a copy of our interrogatory and their answer thereto where they designated this gentleman as being the person responsible for answering questions regarding the research and safety as to their product. It's inconceivable that he could not answer the simple questions that were put to him when he is their expert.

MR. BRALY: He's the personality of the company, Your Honor, on this subject?

A. He comes here and the jury is entitled to judge his demeanor.

MS. DESCHAMPS-BRALY: And his credibility.

MR. BRALY: And his credibility as that of the company. Because they have designated him.

MR. FINNEGAN: If the Court please, that was the question about the presence of nitrosamines and do you consider that to be significant. The Court found that the question, really there is no answer to that. They were asking him whether it is significant from a human health point of view, which he obviously

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does not believe it has been shown to be. On the other hand, if he says no, it makes it appear as if he says it is of no significance; therefore, he is not concerned.

So I am suggesting to the Court that these questions are really not attempts to elicit information.

MS. DESCHAMPS-BRALY: As in instances before, where we have had experts setting up here, it is very simple for a witness to say I can't answer you with a "yes." Now I have go give you this explanation. He wouldn't even do that. He just wouldn't answer.

MR. BRALY: Your Honor, I don't think we can emphasize too much how important it is that the jury be able to judge the credibility of this witness as the person who was designated to testify about the safety of their products.

MR. FINNEGAN: We have one more objection, Your Honor, in addition to that, Your Honor, in the first 20 minutes, I would like to call the Court's attention to pages 24, Lines 10 to Page 24, Line 25, where Mr. Braly is trying to suggest that he's using big words in a way that is inappropriate. He used the words that he used in his deposition because he

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thought that was an appropriate word, and he thinks that it is an inappropriate question to try to suggest that he's trying to use big words to mislead people. He was trying to do the best he could, Your Honor.

MS. DESCHAMPS-BRALY: Your Honor, I think that that is particularly relevant. The gentleman had sitting behind him a blowup of the document where he had spoken to a higherup in the defendant's organization, explaining in very plain English what free nicotine, et cetera, was all about and when asked to talk about it, he then went into a convoluted explanation that the jury would have no way of understanding, and I think that someone sitting on the jury would be capable of determining that he had no intention of their understanding what he was saying.

THE COURT: Yes, I am going to overrule both objections on 23 and 24. Where is your next one?

MR. FINNEGAN: Our next objection Your Honor is on page 38. I am not sure --

THE COURT: That's fine.

MR. FINNEGAN: We are going to reach that.

MR. BRALY: Your Honor, we would like the court to advise the jury that this was the witness

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designated by the company to testify on this subject or else read an interrogatory answer prior to playing this man's deposition.

THE COURT: You would like the Court to do what now?

MR. BRALY: We served an interrogatory on the defendants, which was attached to to the brief we furnished the court.

MS. DESCHAMPS-BRALY: Well, here he said it was attaching. This is defendant's.

MR. BRALY: They designated this man --

THE COURT: I have read that. I think it is on my desk. I don't think I have got it up here.

MR. BRALY: They designated this man as under 30(b)(c) or whatever they do to appear and testify on behalf of the company as their representative with respect to the health and safety of snuff, and we think it is important that the jury understand that, that this is the man that is supposed to be the company's representative to testify on that subject. There is an interrogatory and that interrogatory answer on that subject.

MR. FINNEGAN: If the Court please, we were asked by way of interrogatory who reviewed the literature, as I recall, and we said that Doctor

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Manning has conducted a literature review on the subject of smokeless tobacco.

THE COURT: I think if you have got an interrogatory it would be appropriate for you to read it.

MR. BRALY: That's what I want to do.

THE COURT: Do you have any objection to that?

MR. FINNEGAN: No.

MR. BRALY: I will have.

MR. BRALY: I will have to get it from the court file.

THE COURT: You can do it later, if you would.

MR. BRALY: I would like to see it before the jury hears this.

(An off-the-record side bar conference was here had.)

MR. BRALY: We don't find it here. We will read it the first thing in the morning. Go ahead and start it.

THE COURT: All right.

MR. FINNEGAN: If the Court please, may we approach the bench?

THE COURT: Yes

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(The following proceedings were had AT THE SIDE BAR.)

THE COURT: Yes, sir, Mr. Finnegan.

MR. FINNEGAN: If the Court please, during the early part of this deposition, there were no questions or answers which really get into questions of trade secret, but later on in the deposition we may talk about attorney process and opinions and various pieces of equipment. We very well could be into matters which could be a competitive advantage to -- to competitors of our client, I might at that time urge that this not be played in open court. During the first part of the deposition, there is none, Your Honor.

THE COURT: Right. Let me ask you, I have never had that come up before, where we cleared the galleries so to speak. Do you have any authority? Have any of you thought about that, as far as whether that is permissible.

MR. FINNEGAN: We assumed that it would be permissible, but I can't say that I have any authority for that, Your Honor. We will certainly look at it, though, over evening.

THE COURT: I have never been confronted with that. Have either of you --

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MR. BRALY: Judge, so far as I know, I don't think it has ever been done, I maybe mistaken, but I have never heard of it being done in a public trial.

MS. DESCHAMPS-BRALY: We will do our best to find something over the night.

THE COURT: It would almost seem that if you are going to protect trade secrets, if you can't do that, it almost seems irrelevant protecting trade secrets, so--

MR. FINNEGAN: That's right, Your Honor. There would be certain documents that would be referred to during this deposition that deal with matters that are trade secret. I just wanted to alert the court so that it would not be said later that I did not raise it at the appropriate time when we start the showing of this deposition. We have no objection to this at this point for the first 30 minutes or so, Your Honor.

MR. BRALY: Judge, it's ten minutes of.

THE COURT: Yes, I think we will wait until in the morning. If nobody has any objection, we are going to recess until in the morning. We will reconvene in the morning.

THE CLERK: No.

THE COURT: Reconvene tomorrow afternoon at

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1:15. Remembering this evening, ladies and gentlemen, that don't read or listen to anything about the case, don't make up your mind in the case until you have heard all of the evidence, don't make any private investigation of your on, don't let anyone discuss the case around you, have a nice evening. We will see you at 1:15 tomorrow. Good night. Everyone remain seated while the jury exits.

(The following proceedings were had out of the hearing of the jury.)

THE COURT: Let me go over a couple of things, counsel, on exhibits. I am going to continue sustaining the objection to the chart which compares the various nitrosamines, I believe that is -- is it 223?

MR. BRALY: Let me check the number.

THE CLERK: 230.

THE COURT: 230. I still think it has the potential to be misleading to the jury because of the difference of the nitrosamines involved and the difference in the metabolism involved in the subjects, so I am going to sustain that objection. Also, in regard to the offers of business records --

MR. FINNEGAN: If the Court please, we have a brief, we prepared a brief and we have just filed

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it recently. I don't know whether the court has had an opportunity to --

THE COURT: Well, I don't think I am going to need it.

MR. BRALY: It sounds like bad news, Judge.

THE COURT: I think where a witness has been called to testify and he has prepared a paper or a book that in effect synopsizes his testimony to both have his testimony on that subject and have the paper or study in addition to that, No. 1, it burdens the record unnecessarily, in addition, I think it is redundant.

Additionally, where you offer into evidence a books which has evidence in it in addition to what he has testified about, it may or may not be relevant, and to have that available to the jury I think would have the potential for a problem.

So there might be instances when that would not be true, but generally I just don't think it would be helpful to have both testimony and a study admitted into evidence from a witness. That would be comparable to having a witness testify and then offering to evidence their deposition of what they said at a prior time. So I guess we ought to go down and I will tell you which ones that I am --

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MR. BRALY: Your Honor, as I recall, the only ones that I recall of those that that question has come up on so far are the ones that Court has admitted for other reasons on notice.

THE COURT: Well, that is not true. Plaintiff's 125, which is a study done by Doctor Hecht. It was offered under the business record exception, it was a study done in 1986.

MR. BRALY: Okay.

THE COURT: Obviously, you have again been able to explore that article with him and have been able to explore his testimony in that regard, and I just don't think it would be helpful to the jury or to the record to burden it with that redundancy.

Likewise, --

MR. BRALY: Are you going to strike it from admission?

THE COURT: Well, I have not admitted it.

MR. BRALY: Okay.

THE COURT: I have taken it under advisement, and I am not going to admit it.

Likewise, Plaintiff's Exhibit 112 was a study done in 1984 by Doctor Hecht, and it was again offered under the business records exception, and for the same reason I am going to sustain it. It may

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well be these are business records, I'm not even certain they are business records, a study such this. It may qualify as a business record, but for the reasons you I have stated that it wouldn't be helpful to this proceedings.

The same thing on Plaintiff's Exhibit 110, a study done by Doctor Hecht on the metabolism of tobacco specific nitrosamines. That was done in 1983, but as I stated yesterday, I think anything after he has contracted cancer -- was that '83? Let's see, when did he contract cancer?

MR. FINNEGAN: He was diagnosed --

THE COURT: In '83.

MR. FINNEGAN: -- in April of '83, right.

THE COURT: I don't think it would be subject to the notice, on notice ruling, so I am sustaining the objection as far as not having admitted it into evidence.

Plaintiff's Exhibit 210, again it was a offered as a business record, it is a 1986 study done by Doctor Hecht and I think it would also -- that would be -- apply to my ruling would be applicable to that document.

I am continuing to reserve ruling on defendant's exhibits which you have suggested that

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notice should apply to you as well as to the plaintiff. My inclination is I don't agree with that, but I'll hold that in abeyance. I have read your brief. I have not read the cases that you cite in the brief, but it would just strike me that you are put on notice of something adverse; you are not put on notice on something that might be helpful to you. That would just be my gut reaction to the question of notice.

MR. FINNEGAN: Well, if the Court please, I think our position is that the scientific literature, as a whole, and that you can't take one study or the conclusion of one study without interpreting it against other studies which modify it or bear upon it. That's why we are taking the position from the beginning that we are charged with whatever is in the scientific literature. We have never made an issue of notice or said that we are not aware that there are claims made about the product, but it us our position that one can't take an isolated study and really appreciate the significance of that one way or the other, without also appreciating other studies which referred to it or bear upon it.

THE COURT: Okay. Thank you.

Anything else we need to take up?

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MR. FINNEGAN: Nothing, Your Honor.

MR. BRALY: I don't think so, Judge.

THE COURT: All right. See you tomorrow at 1:15. Court will be in recess.

MR. FINNEGAN: Thank you.

(Court was recessed until 1:15 p.m., Tuesday, June 3, 1986.)

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